

What is claimed is:

1. A method for detecting and compensating for telephone network impairment in signal transmissions between a transmitting modem and a receiving modem coupled together via a telephone network employing robbed bit signaling during super frames,

5 comprising the steps of:

a. repetitively transmitting a known training symbol through said network to a receiving modem;

b. mapping said training symbol at said receiving modem to a high or to a low level value for said symbol;

10 c. repeating said transmitting and determining steps for a number of different known training symbol levels to establish a slicer table that compensates for the nature of the impairment caused by said robbed bit signaling.

2. A method according to claim 1 wherein a constellation of symbol levels is determined from said repetitive transmitting of said known training symbol levels.

15 3. A method according to claim 2 wherein said constellation of symbol levels is determined by identifying the probability density function for each said number of different known training symbol levels.

20 4. A method according to claim 3 wherein said constellation of symbol levels is determined by :

a.) calculating the mean value of said probability density function for each of said training symbol levels;

25 b.) determining the means squared error for each level of said training symbol levels; and

c.) establishing a distance between symbol levels based on said mean squared error at each of said levels.

5. A method for training a receiving modem connected through a telephone network to correct for differences between a transmitted and a received symbol occasioned by network impairment, comprising the steps of:

a. repetitively receiving a known training symbol at said receiving modem;

5 b. selecting between a high and a low value for said training symbol to identify said impairment; and

c. repeating said transmitting and selecting steps for a number of different known training symbol levels to determine a slicer table which compensates for said impairment.

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6. A method according to claim 5, wherein said network impairment includes said network preempting a least significant bit used to encode symbol levels during different phases of network frames, said repetitive transmitting of said known training symbol being continued throughout the duration of a plurality of said encoding frames.

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7. A method according to claim 6, wherein said network causes a received symbol to exhibit a high level during one phase of said network frames and a low level during another phase of said network frames, said slicer table being reconfigurable for each of

20 said phases.

8. A method according to claim 7, wherein said slicer distinguishes between the high and low level values of each of said number of different known training symbol levels received on a particular one of said phases.

9. A method for training a receiving modem connected through a telephone network to correct for differences between a transmitted and a received symbol occasioned by network impairments including robbed bit signaling which preempts a least significant bit of a customer's data depending on the frame assigned by the  
5 network for such connection, comprising the steps of:

- a. repetitively transmitting a known symbol value over said connection to ascertain when said network impairment causes said symbol to be received at said modem as a higher or lower valued symbol;
- b. constructing a slicer table entry containing a higher or lower value of said  
10 symbol for said assigned frame;
- c. repeating said transmitting and said constructing for a number of different known training symbol levels to complete said slicer table; and
- d. re-configuring said slicer table for use on another frame assigned by said network.

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10. A method for training a receiving modem according to claim 9 wherein a constellation of symbol levels is determined by identifying the probability density function for each said number of different known training symbol levels.

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